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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/695,812	10/24/2000	Galen C. Hunt	MS1-547US	4273

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EXAMINER	
DELGADO, MICHAEL A	
ART UNIT	**PAPER NUMBER**
2144	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/695,812	HUNT ET AL.	
	Examiner	Art Unit	
	Michael S. A. Delgado	2144	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02/03/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25 and 73-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25 and 73-76* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/7/05 2/3/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/03/2006 has been entered.

2.

Response to Arguments

1. Applicant's arguments include the failure of previously applied art to expressly disclose "a cluster operations tier to manage the operation of the computers without concern for what applications are executing on the one or more computers". See Response, Remarks dated 11/07/2005, page 9, lines 14-28. It is evident from the detailed mappings found in the above rejection(s) that Wollrath et al disclosed this functionality in a garbage collection system (cluster operations tier) which operates independent of any applications executed on the one or more computers despite a network failure (Col 4, line 40-Col 5, line 5). Further, it is clear from the numerous teachings (previously and currently cited) that the provision for cluster management, was widely implemented in the networking art. Thus, Applicant's arguments drawn toward distinction of the claimed invention and the prior art teachings on this point are not considered persuasive.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-8, 10-12, 14-19, 21-23, 25 and 73-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,801,937 by Novaes et al in view of US 6,519,615 by Wollrath et al.

In claim 1, Novaes teaches about a multi-tiered management architecture comprising (Fig 1):

an application development tier "Resource Manager Component" at which applications are developed for execution on one or more computers (Col 6, lines 30-40);

an application operations tier "Group Service Component" at which execution of the applications is managed (Col 6, lines 19-30); and

but does not explicitly teach about a cluster operations tier to manage the operation of the computers without concern for what applications are executing on the one or more computers. Novaes teach about a distributed system in which resources (clusters) are shared among a group of entities (Col 1, lines 45-60). Wollrath teaches about the benefit of distributed computing as to the efficiency and effectiveness (Col 2, lines 40-50). Wollrath teaches about challenge of operating a distributed system, similar to the system of Novaes, in which resources are shared among multiple computers (Col 2, line 60-Col 3, line 15). Wollrath teaches an

improve approach to distributed computing by providing a leasing arrange between the multiple computers (clients) and a garbage collection system (cluster management tier). Despite a network failure, the garbage system is able to function properly without concern for the application on the one or more computers (Col 4, line 40-Col 5, line 5).

It would have been obvious at the time of the invention for some one of ordinary skill to improve on the invention of Novaes by using the garbage collection system of Wollrath in order to effectively manage resources (clusters) during network failure and recovery.

In claim 2, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1, wherein the cluster, operations tier is responsible for securing a computer cluster boundary to prevent a plurality of other computers that are not part of the computer cluster from, accessing the one or more computers in the computer cluster (Col 8, lines 50-60) (Novaes Col 9, lines 10-15). The unique identifier prevent outside clients from accessing the cluster in question.

In claim 3, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1, wherein the application operations tier is responsible for securing sub-boundaries "grouping" within the computer cluster boundary to restrict communication between computers within the computer cluster (Novaes Col 6, lines 19-30).

In claim 4, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1; wherein the application operations tier is implemented at an application

operations management console at a location remote from the one or more computers (Fig 4) (Novaes Col 4, lines 14-25). Here the processing node can be on different computer, which include a remote computer.

In claim 5, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1, wherein the cluster operations tier is implemented at a cluster operations management console located at the same location as the one or more computers (Fig 6) (Novaes Col 4, lines 14-25).

In claim 6, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1, wherein the application operations tier monitors execution of application processes on the one or more computers and detects failures of the application processes (Novaes Col 6, lines 25-30) and (US 5, 748,958 Novaes Col 3, lines 15-40) incorporated by reference.

In claim 7, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1, wherein the application operations tier takes corrective action in response to a software failure on one of the computers (Novaes Col 6, lines 25-30) (US 5, 748,958 Novaes Col 3, lines 15-40) incorporated by reference.

In claim 8, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 7, wherein the corrective action comprises re-booting the computer (Novaes Col 5, lines 40-50) (Novaes Col 7, lines 50-65) (Novaes Col 17, lines 30-40). In the situation of a software failure (lock up), the node has to be reconfigured, which is accomplished by running the bootstrap program to accomplish the task. This process is well known in the art as a software watchdog program, which requires the rebooting of the hardware in question.

In claim 10, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1, wherein the cluster operations tier monitors hardware operation of the one or more computers and detects failures of the hardware (Novaes Col 6, lines 5-20) (Novaes Col 8, lines 15-20).

In claim 11, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 1, wherein the cluster operations tier takes corrective action in response to a hardware failure of one of the computers (Novaes Col 6, lines 25-30) (Novaes Col 7, lines 55-65) (US 5, 748,958 Novaes Col 3, lines 15-40) incorporated by reference. Software depends on hardware, therefore a failure in hardware result in a failure in software. The recovery process of the Group Service component provides the corrective action need to recover from a hardware failure.

In claim 12, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 11, wherein the corrective action comprises re-booting the computer (Novaes Col 5, lines 40-50) (Novaes Col 7, lines 55-65) (Novaes Col 17, lines 30-40).

In claim 14, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 11, wherein the one or more computers are situated in one or more clusters at a co-location facility (Fig 1).

In claim 15, Novaes combined with Wollrath, teaches about a co-location facility system comprising (Fig 1):

a plurality of node clusters each corresponding to a different customer (Novaes Col 4, lines 55-65); and

a cluster operations management console corresponding to at least one of the node clusters and configured to manage hardware operations of the at least one node cluster (Novaes Col 5, lines 40-50) (Covered in claim 1).

In claim 16, Novaes combined with Wollrath, teaches about a system as recited in claim 15, further comprising a different cluster operations management console corresponding to each of the plurality of node clusters (Fig 2) (Novaes Col 5, lines 15-25).

In claim 17, Novaes combined with Wollrath, teaches about a system as recited in claim 15, wherein each of the plurality of node clusters includes, as its nodes, a plurality of server computers (Fig 1) (Novaes Col 3, lines 60-67) (Novaes Col 13, lines 45-60).

In claim 18, Novaes combined with Wollrath, teaches about a system as recited in claim 15, wherein the hardware operations include one or more of mass storage device operation, memory device operation,
and network interface operation, and processor operation (Fig 11) (Novaes Col 3, lines 35-45).

In claim 19, Novaes combined with Wollrath, teaches about a system as recited in claim 15, wherein each of the plurality of node clusters includes a plurality of nodes configured to receive node control commands from an application operations management console located remotely from the co-location facility (Fig 4) (Novaes Col 4, lines 10-25) (Novaes Col 5, lines 15-25).

In claim 21, Novaes combined with Wollrath, teaches about a system as recited in claim 15, further comprising a data transport medium "LAN" coupled to each node in the plurality of clusters via which each node can access an external network (Novaes Col 3, line 65- Col 4, line 10)

In claim 22, Novaes combined with Wollrath, teaches about a system as recited in claim 15, wherein the external network comprises the Internet. (Novaes Col 4, lines 1-10) (Novaes Col 21, lines 1-10)

In claim 23, Novaes combined with Wollrath, teaches about a system as recited in claim 15, wherein each node in each node cluster is configured with the boundary of the node cluster (Novaes Col 4, lines 55-65).

In claim 25, Novaes combined with Wollrath, teaches about a system as recited in claim 15, wherein one or more of the nodes in a node cluster are leased "negotiated" by the customer from an operator of the co-location facility (Novaes Col 3, lines 35-50).

In claim 73, Novaes combined with Wollrath, teaches about a multi-tiered computer management architecture comprising (Fig 4) (Novaes Col 4, lines 10-25):

a first tier corresponding to an owner of a computer (Fig 4, operating system instance);

a second tier corresponding to a hardware operator that is to manage hardware operations of the computer (Fig 4, DCM Process);

a third tier corresponding to a software operator that is to manage software operations of the computer (Fig 4, Group Service Process); and

a fourth tier corresponding to the owner, wherein the owner operates in the fourth tier except when revoking the rights of the hardware operator or software operator (Fig 4, Resource Manager Process) (Covered in claim 1).

In claim 74, Novaes combined with Wollrath, teaches about an architecture as recited in claim 73, wherein the second tier management is implemented at a management console at a location remote from the computer (Novaes Col 4, lines 10-25). The modularity of the approach allows the each of the tiers to operate without the restriction of location.

In claim 75, Novaes combined with Wollrath, teaches about a architecture as recited in claim 73, wherein the third tier management is implemented at a management console at a location remote from the computer (Novaes Col 4, lines 10-25). The modularity of the approach allows the each of the tiers to operate without the restriction of location.

1. Claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,801,937 by Novaes et al and US 6,519,615 by Wollrath et al in view of US 6,801,937 by Hipp.

In claim 9, Novaes combined with Wollrath, teaches all the limitation but does not explicitly teach about notifying an administrator that a failure has occurred.

In Hipp invention a management architecture "remote management system 70" as recited in claim 7, wherein the corrective action comprises notifying "sound an alarm" an administrator of the failure (Col 22, lines 55-65).

The administrator of a network is most knowledgeable about the operation of a network that he or she is in charge of, and in the case of a failure, possesses the skill that is needed to fix the problem. Down time in a network has to be kept to a minimum and in order to satisfy this requirement it is wise to notify the person that is most knowledgeable and capable of fixing the problem.

It would have been obvious at the time of the invention for some one of ordinary skill to send a notification of a failure to an administrator in order that the problem can be remedy in the shortest time possible.

In claim 13, Novaes combined with Wollrath, teaches about a management architecture as recited in claim 11, wherein the corrective action comprises notifying a co-location facility administrator (Covered in claim 9).

Claims 20, 24 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,801,937 by Novaes et al and US 6,519,615 by Wollrath et al in view of US 6,529,953 by Van Renesse

In claim 20, Novaes combined with Wollrath, teaches all the limitation but does not explicitly teach about using private and public key to support tunneling.

Van Renesse teaches about a system as recited in claim 19, wherein each node in each node cluster "all the node that stores MIBs" is configured with a private key that allows the node to decrypt communications that are received, in a form encrypted using a public key, from the application operations management console "authorized nodes that maintain the MIB" associated with the customer that corresponds to the node cluster (Col 7, lines 34-45) (Col 7, lines 50-60).

In applicant invention different clusters belonging to different users are located on the same physical storage. To prevent the unauthorized use of a cluster out side the assigned group, a system of tunneling using private and public keys for encryption and decryption is used. Unauthorized user if given access can corrupt the clusters and thus render it useless. Like the applicant, Van Renesse discloses the need for security to prevent important storage spaces (MIB storages like applicant's clusters) from being access by interloper. The success in maintaining group state of Novaes invention is hinged on the security that only the members of the group in question are allowed to make changes. Without this security boundary, outside entities would modify the group state, which will cause the system to crash. By adding, the additional security of public/private keys, one is better able to guarantee that only authorized members are allowed to do these critical changes.

It would have been obvious at the time of the invention for some of ordinary skill to use private and public keys system to protect the group state of Novae invention from being access and corrupted by unauthorized users.

In claim 24, a system as recited in claim 15, wherein each node in each node cluster is configured with a private key that allows the node to decrypt communications that are received in a form encrypted using a public key, from the cluster operations management console. (covered in claim 20).

In claim 76, Novaes combined with Wollrath, teaches about an architecture as recited in claim 73, further comprising using a plurality key pairs, each key pair including a private key and a public key, to securely communicate between the computer and a management device corresponding to the hardware operator, as well as between the computer and a management device corresponding to the software operator(Covered in claim 1) (covered in claim 20).

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,047,325 by Jain et al, teaches about a network device for supporting construction of virtual local area networks on arbitrary local and wide area computer networks.

US 6,615,256 by Van Ingenet al, teaches about a quorum resource arbiter within a storage network.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael S. A. Delgado whose telephone number is (571) 272-3926. The examiner can normally be reached on 7.30 AM - 5.30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William C. Vaughn Jr. can be reached on (571)272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MD

WILLIAM C. VAUGHN, JR.
PRIMARY EXAMINER